UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/888,677	06/25/2001	SushilKumar Gangadharan	112056-0009	9968

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EXAMINER
MARTIN, NICHOLAS A

ART UNIT	PAPER NUMBER
2154	

DATE MAILED: 11/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/888,677	GANGADHARAN, SUSHILKUMAR
	Examiner	**Art Unit**
	Nicholas A. Martin	2154

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _25 June 2001_.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-20_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-20_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _25 June 2001_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _6/25/01_.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

1.   Claims 1-20 are presented for examination.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2.   Claims 1, 9-11, and 16 are rejected under U.S.C. 102(e) as being anticipated by

Boucher et al. (hereinafter Boucher) US 2001/0027496.

3.   As per claim 1, Boucher teaches a method for uniformly distributing data

transmitted by a server over a plurality of underlying links of an aggregate within a

computer network comprising:

defining a unit of data as a datagram (Paragraph [0109]);

apportioning each datagram into at least one fragment at the server (Paragraphs

[0067], [0070], [0110] and [0112]);

associating each fragment to an underlying link of the aggregate on the basis of

an Internet protocol (IP) identifier (ID) of each datagram and a number of active links of

the aggregate (Paragraphs [0052], [0057],[0058], [0073] and [0109]); and

transmitting the fragment over its associated underlying link from the server to

the computer network (Paragraphs [0008], [0048],[0049] and [0065]).

4.   As per claim 9, Boucher teaches the method of claim 1, further comprising:

loading at least one data buffer of the server with the at least one fragment

(Paragraph [0071]);

fetching the fragment from the data buffer (Paragraph [0071]); and

loading at least one queue of the server with the fragment, the queue associated

with the underlying link (Paragraphs [0042], [0053] and [0083]).

5.   As per claim 10, Boucher teaches a system adapted to uniformly distributing data

over a plurality of underlying links of an aggregate within a computer network,

comprising:

a processor (Paragraph [0049]);

a memory coupled to the processor and having locations addressable by the

processor (Paragraph [0049]);

an operating system resident in the memory locations and executed by the

processor, the operating system configured to implement a modified load balancing

technique that defines a unit of data as a datagram, the operating system comprising an

Internet Protocol layer (IP) that apportions the datagram into at least one fragment, the

operating system further comprising a virtual interface process that associates the

fragment to an underlying link of the aggregate on the basis of an IP identifier (ID) of the

datagram and a number of active links of the aggregate (Paragraphs [0010], [0011],

[0109], [0112], [0276] and [0462]); and

at least one network adapter coupled to the memory and processor that

cooperates with a network driver of the operating system to transmit the fragment over

the associated underlying link to the computer network (Paragraphs [0048], [0049],

[0276] and [0462]).

6.   Claims 11 and 16 do not teach or define any new limitations above claim 1 and

therefore is rejected for similar reasons.

Claim Rejections - 35 USC § 103

7.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

8.   Claims 2, 3,12, 13, 17 and 18 are rejected under U.S.C. 103(a) as being

unpatentable over Boucher et al. (hereinafter Boucher) US 2001/0027496 , in view of

Takagi, Masahiro (hereinafter Takagi) US 2001/0036154.

9.   As per claim 2, Boucher does not explicitly teach the method of claim 1 wherein the

step of associating comprises the step of producing a result representing a remainder

upon dividing the IP ID by the number of active links.

10.   Takagi teaches the method of claim 1 wherein the step of associating comprises

the step of producing a result representing a remainder upon dividing the IP ID by the

number of active links (Paragraph [0058]).

11.   It would have been obvious to one of ordinary skill in this art at the time of invention

was made to combine the teaching of Boucher and Takagi because they both deal with

transmitting a datagram over a network and associating each fragment to an active link

accordingly. The teaching of Takagi is to divide the TCP/IP packet into a plurality of link layer frames, which is a representation of the number of active links available. Takagi discloses the frame formation is for the non-transmitted packets of the TCP/IP connection, which is viewed as the remainder. Furthermore, the teaching of Takagi to produce a result representing a remainder upon dividing the IP ID by the number of active links would improve the functionality of Boucher's method by allowing for each datagram fragment to be transferred simultaneously and individually along distinct underlying links.

12.   As per claim 3, Boucher teaches the method of claim 2 wherein the step of associating further comprises:

calculating the IP ID of each datagram in a sequential manner (Paragraphs [0091],[0109] and [0564]); and

rotating the fragments of each datagram among all the underlying links to thereby ensure that all fragments having the same IP ID are provided to the same physical link of the aggregate (Paragraphs [0005] and [0561]).

13.   Claims 12 and 17 do not teach or define any new limitations above claim 2 and therefore is rejected for similar reasons.

14.   Claim 13 and 18 do not teach or define any new limitations above claim 3 and therefore is rejected for similar reasons.

15.   Claims 4, 14 and 19 are rejected under U.S.C. 103(a) as being unpatentable over Boucher et al. (hereinafter Boucher) US 2001/0027496 , in view of Narad et al. (hereinafter Narad) US 6,157,955.

16.   As per claim 4, Boucher does not explicitly teach the method of claim 1 wherein

the step of associating comprising:

      logically combining the IP ID with a predetermined mask to produce a quantity;

      right shifting the quantity a predetermined number of places; and

      establishing a threshold at which a group of data is forwarded to each underlying

link of the aggregate.

17.   Narad teaches the method of claim 1 wherein the step of associating comprises:

      logically combining the IP ID with a predetermined mask to produce a quantity

(Col. 37, lines 2-6; Col. 91, lines 51-56);

      right shifting the quantity a predetermined number of places (Col. 42, lines 42-48);

and

      establishing a threshold at which a group of data is forwarded to each underlying

link of the aggregate (Col. 6, lines 56-62; Col. 8, lines 21-29).

18.   It would have been obvious to one of ordinary skill in the art at the time of

invention was made to combine the teaching of Boucher and Narad because they both

deal with processing data in-order to transmit information through a network of

communication links. Furthermore, the teaching of Narad to combine the IP ID with a

predetermined mask, then to right shift the combined value a predetermined number of

places while establishing a threshold at which a group of data is forwarded to each

underlying link accelerates the association of a datagram and increases efficiency with

the system Boucher discloses.

19.   Claims 14 and 19 do not teach or define any new limitations above claim 4 and

therefore is rejected for similar reasons.

20.   Claims 5, 15 and 20 are rejected under U.S.C. 103(a) as being unpatentable

over Boucher in view of Takagi as applied to claims 2, 12 and 17 above, and in further

view of Narad.

21.   As per claim 5, Takagi teaches the method of claim 4 wherein the step of

associating comprises the step of producing a result representing a remainder upon

dividing Internet Protocol by the number of active links (Paragraph [0058]).

22.   Takagi does not teach the step of dividing the right shifted logically combined IP

ID and predetermined mask by the number of active links.

23.   Narad teaches a method comprising:

       a combined quantity of IP ID and a predetermined mask (Col. 37, lines 2-6; Col.

91, lines 51-56); and

       right shifting the combined quantity a predetermined number of places (Col. 42,

lines 42-48).

24.   It would have been obvious to one of ordinary skill in the art at the time the

invention was made to combine the teachings of Boucher, Takagi and Narad because

they each discuss methods process a datagram or packet in-order to distribute the data

over a network through a plurality of links. Furthermore, the teaching of Narad to

combine the quantity of the right shifted IP ID and predetermined mask in connection

with Takagi's teaching to produce a result by dividing the combined quantity by the

number of links allows for data to be transmitted more efficiently and uniformly through

grouped underlying links within a computer network.

25.   Claims 15 and 20 do not teach or define any new limitations above claim 5 and

therefore is rejected for similar reasons.

26.   Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Boucher, Takagi and Narad, in view of 'Official Notice'.

27.   As per claim 6, Boucher does not explicitly teach the method of claim 5.

28.   Narad teaches a predetermined mask in association with Internet Protocol and a

predetermined number of right shifted places (Col. 37, lines2-6; Col. 91, lines 51-56;

Col. 42, lines 42-48).

29.   Boucher and Narad do not teach the method of claim 5 wherein the IP ID is a 16-

bit value, the predetermined mask is 0xFF80 and predetermined number of right shifted

places is 7, and wherein the group of data comprises 128 IP IDs. However 'Official

Notice' is taken by the Examiner that Internet protocol identification (IP ID) protocol is

well know. It would have been obvious to one of ordinary skill in the art to incorporate

Ipv6 standards for the 16-bit value of the IP ID. It would be obvious to arbitrarily set the

predetermined mask as 0xFF80 because this would justify a standard mask for data

transmittal. Also, it would have been obvious to combine the teaching of Narad who

discloses a predetermined number of right shifted places to arbitrarily set the number of

places to 7. From the number of shifted places, it would be obvious the data comprises

of 128 IP IDs where in binary form, 2 to the power of 7, comprises of 128 possibilities, because doing so would increase ID possibilities and improve data transfer efficiency.

30.   Claim 7 does not teach or define any new limitations above claim 6 and therefore is rejected for similar reasons.

31.   As per claim 8, Narad does not explicitly teach a method of claim 7 wherein each datagram comprises up to 23 fragments.

32.   Narad teaches that each IP layer datagram consists of a sequence of IP fragments. 'Official Notice' is taken by the Examiner that User Datagram Protocol (UDP) is well know. It would be obvious to one skilled in the art to arbitrarily set the number of fragments a datagram can be broken into to 23 because this would justify a maximum number fragments to be transmitted over the network of links.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents and publications are cited to further show the state of the art with respect to "Modified Round Robin Load Balancing Technique Based On IP Identifier".

i.   US 2002/0087716   Mustafa, Shakeel.

ii.   "A Measurement Analysis of Internet

    Traffic over Frame Relay"   Jerkins, Judith L.

Any inquiry concerning this communication or earlier communications from the
examiner should be directed to Nicholas A. Martin whose telephone number is (703)
605-4352. The examiner can normally be reached on Monday - Friday 8:30 a.m. - 5:00
p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, John A. Follansbee can be reached on (703) 305-8498. The fax phone
number for the organization where this application or proceeding is assigned is 703-
872-9306.

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September 28, 2004

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